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Date Mailed : April 2, 2007

Patent No. : 7,137,969
Inventor : Mendez, Ivar
Patent Issued : November 21, 2006
Title : NEURAL TRANSPLANTATION DELIVERY SYSTEM
Docket No. : GRON-3402

Re: Request for Certificate of Correction

Consideration has been given your request for the issuance of a certificate of correction for the above-identified patent under the provisions of Rule 1.322.

Inspection of the file of the application for the patent reveals that columns 12, 15, 16, 17 and 18 of the specification is/are printed in accordance with the record in the Patent and Trademark Office, as passed to issue by the examiner. There being no fault on the part of the Patent and Trademark Office, it has no authority to issue a certificate of correction under the provision of 1.322.

In view of the foregoing, your request for certificate of correction is hereby denied. However, further consideration will be given these matters, upon receipt of a request for certificate of correction under the provisions of 1.323, accompanied by the appropriate fee which is presently $100.

A certificate of correction will be issued to correct the error(s) noted in your request.

Future correspondence concerning this matter should be filed and directed to Decisions & Certificates of Correction Branch.

Commissioner of Patents
P.O. Box 1450
Alexandria, VA 22313-1450
Attn: Certificates of Correction Branch

David Irvine
Cecilia Newman, Supervisor
Decisions & Certificates of Correction Branch
703/308-9590 or 703/305-4362 (Fax 571/270-9806)

OUR Claims		PTO Claims
2	↔	1
3 - dep on cl 2	↔	2 - dep on cl 1
4 - dep on cl 2	↔	3 - dep on cl 2 (should be cl 1)
5 - dep on cl 2	↔	4 - dep on cl 3 (should be cl 1)
7 - dep on cl 5	↔	5 - dep on cl 4
8 - dep on cl 2	↔	6 - dep on cl 5 (should be cl 1)
9 - dep on cl 2	↔	7 - dep on cl 6 (should be cl 1)
10 - dep on cl 2	↔	8 - dep on cl 7 (should be cl 1)
11 - dep on cl 2	↔	9 - dep on cl 8 (should be cl 1)
12 - dep on cl 2	↔	10 - dep on cl 9 (should be cl 1)
13 - dep on cl 2	↔	11 - dep on cl 10 (should be cl 1)
14 - dep on cl 2	↔	12 - dep on cl 11 (should be cl 1)
15 - dep on cl 2	↔	13 - dep on cl 12 (should be cl 1)
18 - dep on cl 16	↔	14 - dep on cl 13 **(should be cl 27)**
21 - dep on cl 3	↔	15 - dep on cl 1 (should be cl 2)
22 - dep on cl 21	↔	16 - dep on cl 1 (should be cl 15)
6 - dep on cl 5	↔	17 - dep on cl 16 (shsould be cl 4)
23 - dep on cl 22	↔	18 - dep on cl 16
24 - dep on cl 23	↔	19 - dep on cl 1 (should be cl 18)
25 - dep on cl 24	↔	20 - dep on cl 1 (should be cl 19)
26 - dep on cl 25	↔	21 - dep on cl 1 (should be cl 20)
27 - dep on cl 26	↔	22 - dep on cl 1 (should be cl 21)
28 - dep on cl 27	↔	23 - dep on cl 1 (should be cl 22)
29 - dep on cl 28	↔	24 - dep on cl 1 (should be cl 23)
30 - dep on cl 29	↔	25 - dep on cl 1 (should be cl 24)
31 - dep on cl 30	↔	26 - dep on cl 1 (should be cl 25)
16 - dep on cl 15	↔	27 - dep on cl 26 (should be cl 13)
17 - dep on cl 16	↔	28 - dep on cl 27
32 - dep on cl 31	↔	29 - dep on cl 27 (should be 26)
35 - dep on cl 2	↔	30 - dep on cl 1
36 - dep on cl 2	↔	31 - dep on cl 2 (should be cl 1)
37 - dep on cl 36	↔	32 - dep on cl 31

move cl 27 to above cl 14

New Claims
1
2 - dep on cl 1
3 - dep on cl 1
4 - dep on cl 1
5 - dep on cl 4
6 - dep on cl 1
7 - dep on cl 1
8 - dep on cl 1
9 - dep on cl 1
10 - dep on cl 1
11 - dep on cl 1
12 - dep on cl 1
13 - dep on cl 1
14 - dep on cl 13
15 - dep on cl 14
16 - dep on cl 2
17 - dep on cl 16
18 - dep on cl 4
19 - dep on cl 17
20 - dep on cl 19
21 - dep on cl 20
22 - dep on cl 21
23 - dep on cl 22
24 - dep on cl 23
25 - dep on cl 24
26 - dep on cl 25
27 - dep on cl 26
28 - dep on cl 14
29 - dep on cl 27
30 - dep on cl 1
31 - dep on cl 1
32 - dep on cl 31

IN THE CLAIMS:

The claims are as follows:

1. A neural transplantation device for use with a syringe (3), including a syringe barrel (7) and plunger (12), said device comprising:

- a cannula (2) adapted for connection to a distal end of the syringe barrel (7), said cannula (2) having a single passageway with an open upper end and a lower end defining a blunt closed tip (14) and having a pair of side port holes (15A),(15B) that are diametrically opposed and slightly offset to each other near the vicinity of the cannula tip (14);

- a microinjector (1) adapted for connection to a proximal end of a syringe barrel (7) and in cooperation with the syringe plunger (12) for effecting incremental depression of the plunger (12), said microinjector (1) comprising a longitudinal hollow cylindrical sleeve (4) extending into a cylindrical barrel (5) of larger diameter at the distal end thereof, said sleeve (4) capable of receiving a syringe plunger (12), a guide nut (8) rotatably adjustable within the cylindrical barrel (5) and adapted to cooperate with the proximal end of the syringe barrel, (7) and a driver rotatably mounted near the proximal end of the cylindrical sleeve (4) and adapted to cooperate with the syringe plunger (12), whereby operation of the microinjector (1) in combination with the syringe (3) and the cannula (2) allows delivery of an injection such that rotation of the driver renders a downward axial force to the plunger (12) of the syringe (3) thereby aspirating contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2); while rotation of the guide nut (8) in the opposite direction moves the syringe (3) in an upward axial direction to

reposition the cannula (2); and rotation of the driver and the guide nut (8) in a repeated manner facilitates sequential delivery of multiple portions of the contents of the syringe barrel (7) along a single trajectory in a three-dimensional spiral array at a predetermined neural injection site; and

- whereby upon placement of the cannula (2) at a predetermined targeted neural site, the microinjector (1) is capable of effecting incremental depression of the plunger (12) to result in a metered delivery of the contents of the syringe barrel (7) through the cannula port holes (15A),(15B) at the targeted site.

2. The neural transplantation device according to Claim 1, characterized in that the guide nut (8) is a small hollow cylindrical spool with a collar (9) at its extreme distal end that acts as a lower boundary stop to limit its position inside the cylindrical barrel (5) when fully wound inside.

3. The neural transplantation device according to Claim 1, characterized in that an exterior wall of the guide nut (8) and an interior wall of the cylindrical barrel (5), which receives the guide nut (8), are threaded such that rotation of the guide nut (8) relative to the cylindrical barrel (5) causes a corresponding linear, axial movement of the guide nut (8) through the cylindrical barrel (5).

4. The neural transplantation device according to Claim 1, characterized in that the driver comprises a plunger driver (11) and a drive nut (10).

5. The neural transplantation device according to Claim 4, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the plunger driver (11) and the drive nut (10) are threaded such that rotation of either the plunger driver (11) or drive nut (10) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the plunger driver (11), drive nut (10), and the syringe plunger (12).

6. The neural transplantation device according to Claim 1, characterized in that the cannula (2) has a length sufficient to linearly penetrate and enter a host brain such that the pair of side port holes (15A),(15B) is concurrently positionable at a predetermined targeted site within the host brain.

7. The neural transplantation device according to Claim 1, characterized in that the cannula (2) has an outside diameter of about 0.8 mm.

8. The neural transplantation device according to Claim 1, characterized in that the side port holes (15A),(15B) are positioned such that the distances between a distal edge of a first (15B) and a second side port hole (15A) to the cannula tip (14) are about 1.0 mm and 3.0 mm, respectively.

9. The neural transplantation device according to Claim 1, characterized in that the diameters of the side port holes are the same.

10. The neural transplantation device according to Claim 1, characterized in that the diameter of each side port hole (15A),(15B) is 0.3 mm.

11. The neural transplantation device according to Claim 1, characterized in that the microinjector (1) is manufactured from acetal nylon and ionized aluminum.

12. The neural transplantation device according to Claim 1, characterized in that the cannula (2) is manufactured from stainless steel.

13. A method of using a neural transplantation device defined according to Claim 1 for administering an injection, comprising the steps of:

- positioning the syringe plunger (12) in an initial upward position;
- positioning the syringe barrel (7) with attached guide nut (8) in an essentially unwound position inside the cylindrical barrel (5) of the sleeve (4) of the microinjector (1);
- rotating the driver to advance the syringe plunger (12) in a downward axial direction through the syringe barrel (7) thereby aspirating and depositing a portion of the contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2);
- rotating the guide nut (8) to effectively withdraw the syringe (3) and cannula (2) in an upward axial direction at a predetermined distance away from a previous neural target site; and
- repeating steps involving rotating the driver to deliver a portion of the contents of the syringe barrel (7) and rotating the guide nut (8) to reposition the cannula (2), thereby resulting in sequential delivery of multiple portions of the contents of the syringe barrel

(7) in a three-dimensional spiral array per single trajectory at a predetermined neural target site.

14. The method according to Claim 13, characterized in that the driver comprises a plunger driver (11) and a drive nut (10).

15. The method according to Claim 14, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the plunger driver (11) and the drive nut (10) are threaded such that rotation of either the drive nut (10) or plunger driver (11) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and the syringe plunger (12).

16. The neural transplantation device according to Claim 2, characterized in that an exterior wall of the guide nut (8) and an interior wall of the cylindrical barrel (5), which receives the guide nut (8), are threaded such that rotation of the guide nut (8) relative to the cylindrical barrel (5) causes a corresponding linear, axial movement of the guide nut (8) through the cylindrical barrel (5).

17. The neural transplantation device according to Claim 16, characterized in that the driver comprises a plunger driver (11) and a drive nut (10).

18. The neural transplantation device according to Claim 4, characterized in that the plunger driver (11) is adapted to cooperate with the proximal end of the syringe plunger

(12) and a distal end of the drive nut (10) is engaged with a proximal end of the plunger driver (11), such that rotation of either the drive nut (10) or plunger driver (11) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and syringe plunger (12).

19. The neural transplantation device according to Claim 17, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the plunger driver (11) and the drive nut (10) are threaded such that rotation of either the plunger driver (11) or drive nut (10) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the plunger driver (11), drive nut (10), and the syringe plunger (12).

20. The neural transplantation device according to Claim 19, characterized in that the cannula (2) has a length sufficient to linearly penetrate and enter a host brain such that the pair of side port holes (15A), (15B) is concurrently positionable at a predetermined targeted site within the host brain.

21. The neural transplantation device according to Claim 20, characterized in that the cannula (2) has an outside diameter of about 0.8 mm.

22. The neural transplantation device according to Claim 21, characterized in that the side port holes (15A),(15B) are positioned such that the distances between a distal edge of a

first (15B) and a second side port hole (15A) to the cannula tip (14) are about 1.0 mm and 3.0 mm, respectively.

23. The neural transplantation device according to Claim 22, characterized in that the diameters of the side port holes are the same.

24. The neural transplantation device according to Claim 23, characterized in that the diameter of each side port hole (15A),(15B) is 0.3 mm.

25. The neural transplantation device according to Claim 24, characterized in that the microinjector (1) is manufactured from acetal nylon and ionized aluminum.

26. The neural transplantation device according to Claim 25, characterized in that the cannula (2) is manufactured from stainless steel.

27. A method of using a neural transplantation device defined according to Claim 26, for administering an injection, comprising the steps of:

- positioning the syringe plunger (12) in an initial upward position;
- positioning the syringe barrel (7) with attached guide nut (8) in an essentially unwound position inside the cylindrical barrel (5) of the sleeve (4) of the microinjector (1);
- rotating the driver to advance the syringe plunger (12) in a downward axial direction through the syringe barrel (7) thereby aspirating and depositing a portion of the contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2);

- rotating the guide nut (8) to effectively withdraw the syringe (3) and cannula (2) in an upward axial direction at a predetermined distance away from a previous neural target site; and

- repeating steps involving rotating the driver to deliver a portion of the contents of the syringe barrel (7) and rotating the guide nut (8) to reposition the cannula (2), thereby resulting in sequential delivery of multiple portions of the contents of the syringe barrel (7) in a three-dimensional spiral array per single trajectory at a predetermined neural target site.

28. The method according to Claim 14, characterized in that the plunger driver (11) is adapted to cooperate with the proximal end of the syringe plunger (12) and the distal end of the drive nut (10) is engaged with the proximal end of the plunger driver (11), such that rotation of either the drive nut (10) or plunger driver (11) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and syringe plunger (12).

29. The method according to Claim 27, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the plunger driver (11) and the drive nut (10) are threaded such that rotation of either the drive nut (10) or plunger driver (11) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and the syringe plunger (12).

30. The neural transplantation device according to Claim 1, characterized in that the driving means comprises a plunger driver (11) and a drive nut (10).

31. A method of using a neural transplantation device defined according to Claim 1 for administering an injection, comprising the steps of:

- positioning the syringe plunger (12) in an initial upward position;
- positioning the syringe barrel (7) with attached guide nut (8) in an essentially unwound position inside the cylindrical barrel (5) of the sleeve (4) of the microinjector (1);
- rotating the driving means to advance the syringe plunger (12) in a downward axial direction through the syringe barrel (7) thereby aspirating and depositing a portion of the contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2);
- rotating the guide nut (8) to effectively withdraw the syringe (3) and cannula (2) in an upward axial direction at a predetermined distance away from a previous neural target site; and
- repeating steps involving rotating the driving means to deliver a portion of the contents of the syringe barrel (7) and rotating the guide nut (8) to reposition the cannula (2), thereby resulting in sequential delivery of multiple portions of the contents of the syringe barrel (7) in a three-dimensional spiral array per single trajectory at a predetermined neural target site.

32. The method according to Claim 31, characterized in that the driving means comprises a plunger driver (11) and a drive nut (10).

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Ivar Mendez

Art Unit: 3763

Serial No.:10/088,047

Docket No.: GRON-3402

Filed: July 11, 2002

Examiner: Catherine S. Williams

Title: **NEURAL TRANSPLANTATION DELIVERY SYSTEM**

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

AMENDMENT

This Amendment is in response to the Final Office Action mailed October 5, 2005.

IN THE CLAIMS:

The claims are as follows:

1. (Currently Amended) A neural transplantation device for use with a syringe (3), including a syringe barrel (7) and plunger (12), said device comprising:

- a microinjector (1) adapted for connection to a proximal end of a syringe barrel (7) and in cooperation with the syringe plunger (12) for effecting incremental depression of the plunger (12) to result in a metered delivery of the contents of the syringe barrel (7); and

- a cannula (2) adapted for connection to a distal end of the syringe barrel (7), said cannula (2) having a single passageway with an open upper end and a lower end defining a blunt closed tip (14) and having a pair of side port holes (15A),(15B) that are diametrically opposed and slightly longitudinally offset to each other near the vicinity of the cannula tip (14);

whereby the microinjector and cannula are adapted for interconnection with the syringe in a configuration which facilitates sequential delivery of multiple portions of the contents of the syringe along a single trajectory in a three dimensional spiral array at a predetermined neural injection site.

2. (Previously Presented) A neural transplantation device for use with a syringe (3), including a syringe barrel (7) and plunger (12), said device comprising:

- a cannula (2) adapted for connection to a distal end of the syringe barrel (7), said cannula (2) having a single passageway with an open upper end and a lower end defining a blunt closed tip (14) and having a pair of side port holes (15A),(15B) that are diametrically opposed and slightly

offset to each other near the vicinity of the cannula tip (14);

- a microinjector (1) adapted for connection to a proximal end of a syringe barrel (7) and in cooperation with the syringe plunger (12) for effecting incremental depression of the plunger (12), said microinjector (1) comprising a longitudinal hollow cylindrical sleeve (4) extending into a cylindrical barrel (5) of larger diameter at the distal end thereof, said sleeve (4) capable of receiving a syringe plunger (12), a guide nut (8) rotatably adjustable within the cylindrical barrel (5) and adapted to cooperate with the proximal end of the syringe barrel, (7) and a driver rotatably mounted near the proximal end of the cylindrical sleeve (4) and adapted to cooperate with the syringe plunger (12), whereby operation of the microinjector (1) in combination with the syringe (3) and the cannula (2) allows delivery of an injection such that rotation of the driver renders a downward axial force to the plunger (12) of the syringe (3) thereby aspirating contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2); while rotation of the guide nut (8) in the opposite direction moves the syringe (3) in an upward axial direction to reposition the cannula (2); and rotation of the driver and the guide nut (8) in a repeated manner facilitates sequential delivery of multiple portions of the contents of the syringe barrel (7) along a single trajectory in a three-dimensional spiral array at a predetermined neural injection site; and

- whereby upon placement of the cannula (2) at a predetermined targeted neural site, the microinjector (1) is capable of effecting incremental depression of the plunger (12) to result in a metered delivery of the contents of the syringe barrel (7) through the cannula port holes (15A),(15B) at the targeted site.

3. (Original) The neural transplantation device according to Claim 2, characterized in that the guide nut (8) is a small hollow cylindrical spool with a collar (9) at its extreme distal end that acts as a lower boundary stop to limit its position inside the cylindrical barrel (5) when fully wound inside.

4. (Previously Presented) The neural transplantation device according to Claim 2, characterized in that an exterior wall of the guide nut (8) and an interior wall of the cylindrical barrel (5), which receives the guide nut (8), are threaded such that rotation of the guide nut (8) relative to the cylindrical barrel (5) causes a corresponding linear, axial movement of the guide nut (8) through the cylindrical barrel (5).

5. (Previously Presented) The neural transplantation device according to Claim 2, characterized in that the driver comprises a plunger driver (11) and a drive nut (10).

6. (Original) The neural transplantation device according to Claim 5, characterized in that the plunger driver (11) is adapted to cooperate with the proximal end of the syringe plunger (12) and a distal end of the drive nut (10) is engaged with a proximal end of the plunger driver (11), such that rotation of either the drive nut (10) or plunger driver (11) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and syringe plunger (12).

7. (Previously Presented) The neural transplantation device according to Claim 5, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the

plunger driver (11) and the drive nut (10) are threaded such that rotation of either the plunger driver (11) or drive nut (10) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the plunger driver (11), drive nut (10), and the syringe plunger (12).

8. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the cannula (2) has a length sufficient to linearly penetrate and enter a host brain such that the pair of side port holes (15A),(15B) is concurrently positionable at a predetermined targeted site within the host brain.

9. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the cannula (2) has an outside diameter of about 0.8 mm.

10. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the side port holes (15A),(15B) are positioned such that the distances between a distal edge of a first (15B) and a second side port hole (15A) to the cannula tip (14) are about 1.0 mm and 3.0 mm, respectively.

11. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the diameters of the side port holes are the same.

12. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the diameter of each side port hole (15A),(15B) is 0.3 mm.

13. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the microinjector (1) is manufactured from acetal nylon and ionized aluminum.

14. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the cannula (2) is manufactured from stainless steel.

15. (Previously Presented) A method of using a neural transplantation device defined according to Claim 2 for administering an injection, comprising the steps of:

- positioning the syringe plunger (12) in an initial upward position;
- positioning the syringe barrel (7) with attached guide nut (8) in an essentially unwound position inside the cylindrical barrel (5) of the sleeve (4) of the microinjector (1);
- rotating the driver to advance the syringe plunger (12) in a downward axial direction through the syringe barrel (7) thereby aspirating and depositing a portion of the contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2);
- rotating the guide nut (8) to effectively withdraw the syringe (3) and cannula (2) in an upward axial direction at a predetermined distance away from a previous neural target site; and
- repeating steps involving rotating the driver to deliver a portion of the contents of the syringe barrel (7) and rotating the guide nut (8) to reposition the cannula (2), thereby resulting in sequential delivery of multiple portions of the contents of the syringe barrel (7) in a three-dimensional spiral array per single trajectory at a predetermined neural target site.

16. (Previously Presented) The method according to Claim 15, characterized in that the driver comprises a plunger driver (11) and a drive nut (10).

17. (Original) The method according to Claim 16, characterized in that the plunger driver (11) is adapted to cooperate with the proximal end of the syringe plunger (12) and the distal end of the drive nut (10) is engaged with the proximal end of the plunger driver (11), such that rotation of either the drive nut (10) or plunger driver (11) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and syringe plunger (12).

18. (Previously Presented) The method according to Claim 16, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the plunger driver (11) and the drive nut (10) are threaded such that rotation of either the drive nut (10) or plunger driver (11) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and the syringe plunger (12).

19. (Previously Presented) A bullet guide (16) for use in combination with a stereotactic frame which functions as a mechanical guiding system for the neural transplantation cannula according to Claim 1, comprising:

- a top member (17) comprising a hollow cylindrical element having a closed end with an array of equidistantly spaced holes (19A) sized to accommodate the insertion of the cannula (2); and
- a bottom member (20) comprising a hollow cylindrical element of the same diameter as the top member (17) but having a longer longitudinal axis; said bottom member (20) being closed at

both ends and each end having an array of equidistantly spaced holes (21A),(21B) sized to accommodate the insertion of the cannula (2);

- characterized in that the top member (17) and bottom member (20) are mounted in spaced coaxial alignment in the stereotactic frame with the respective arrays of holes (19A),(21A),(21B) in mutual alignment to guide deployment of the cannula (2) through an aligned set of said holes (19A),(21A),(21B) to a predetermined cerebral target.

20. (Previously Presented) The bullet guide (16) according to Claim 19, characterized in that the top member (17) and bottom member (20) are manufactured from acetal nylon.

21. (Previously Presented) The neural transplantation device according to Claim 3, characterized in that an exterior wall of the guide nut (8) and an interior wall of the cylindrical barrel (5), which receives the guide nut (8), are threaded such that rotation of the guide nut (8) relative to the cylindrical barrel (5) causes a corresponding linear, axial movement of the guide nut (8) through the cylindrical barrel (5).

22. (Previously Presented) The neural transplantation device according to Claim 21, characterized in that the driver comprises a plunger driver (11) and a drive nut (10).

23. (Previously Presented) The neural transplantation device according to Claim 22, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the plunger driver (11) and the drive nut (10) are threaded such that rotation of either the

plunger driver (11) or drive nut (10) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the plunger driver (11), drive nut (10), and the syringe plunger (12).

24. (Previously Presented) The neural transplantation device according to Claim 23 , characterized in that the cannula (2) has a length sufficient to linearly penetrate and enter a host brain such that the pair of side port holes (15A),(15B) is concurrently positionable at a predetermined targeted site within the host brain.

25. (Previously Presented) The neural transplantation device according to Claim 24, characterized in that the cannula (2) has an outside diameter of about 0.8 mm.

26. (Previously Presented) The neural transplantation device according to Claim 25, characterized in that the side port holes (15A),(15B) are positioned such that the distances between a distal edge of a first (15B) and a second side port hole (15A) to the cannula tip (14) are about 1.0 mm and 3.0 mm, respectively.

27. (Previously Presented) The neural transplantation device according to Claim 26, characterized in that the diameters of the side port holes are the same.

28. (Previously Presented) The neural transplantation device according to Claim 27, characterized in that the diameter of each side port hole (15A),(15B) is 0.3 mm.

29. (Previously Presented) The neural transplantation device according to Claim 28, characterized in that the microinjector (1) is manufactured from acetal nylon and ionized aluminum.

30. (Previously Presented) The neural transplantation device according to Claim 29, characterized in that the cannula (2) is manufactured from stainless steel.

31. (Previously Presented) A method of using a neural transplantation device defined according to Claim 30, for administering an injection, comprising the steps of:

- positioning the syringe plunger (12) in an initial upward position;
- positioning the syringe barrel (7) with attached guide nut (8) in an essentially unwound position inside the cylindrical barrel (5) of the sleeve (4) of the microinjector (1);
- rotating the driver to advance the syringe plunger (12) in a downward axial direction through the syringe barrel (7) thereby aspirating and depositing a portion of the contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2);
- rotating the guide nut (8) to effectively withdraw the syringe (3) and cannula (2) in an upward axial direction at a predetermined distance away from a previous neural target site; and
- repeating steps involving rotating the driver to deliver a portion of the contents of the syringe barrel (7) and rotating the guide nut (8) to reposition the cannula (2), thereby resulting in sequential delivery of multiple portions of the contents of the syringe barrel (7) in a three-dimensional spiral array per single trajectory at a predetermined neural target site.

32. (Previously Presented) The method according to Claim 31, characterized in that an exterior wall of the longitudinal cylindrical sleeve (4) and an interior wall of the plunger driver (11) and the drive nut (10) are threaded such that rotation of either the drive nut (10) or plunger driver (11) relative to the cylindrical sleeve (4) causes a corresponding linear, axial movement of the drive nut (10), plunger driver (11), and the syringe plunger (12).

33. (Previously Presented) A bullet guide (16) for use in combination with a stereotactic frame which functions as a mechanical guiding system for the neural transplantation cannula according to Claim 30, comprising:

- a top member (17) comprising a hollow cylindrical element having a closed end with an array of equidistantly spaced holes (19A) sized to accommodate the insertion of the cannula (2); and
- a bottom member (20) comprising a hollow cylindrical element of the same diameter as the top member (17) but having a longer longitudinal axis; said bottom member (20) being closed at both ends and each end having an array of equidistantly spaced holes (21A),(21B) sized to accommodate the insertion of the cannula (2);
- characterized in that the top member (17) and bottom member (20) are mounted in spaced coaxial alignment in the stereotactic frame with the respective arrays of holes (19A),(21A),(21B) in mutual alignment to guide deployment of the cannula (2) through an aligned set of said holes (19A),(21A),(21B) to a predetermined cerebral target.

34. (Previously Presented) The neural transplantation device according to Claim 1, characterized in that the microinjector (1) comprises:

- a longitudinal hollow cylindrical sleeve (4) extending into a cylindrical barrel (5) of larger diameter at the distal end thereof, said sleeve (4) capable of receiving a syringe plunger (12);
- a guide nut (8) rotatably adjustable within the cylindrical barrel (5) and adapted to cooperate with the proximal end of the syringe barrel (7); and
- a driving means rotatably mounted near the proximal end of the cylindrical sleeve (4) and adapted to cooperate with the syringe plunger (12);
- whereby operation of the microinjector (1) in combination with the syringe (3) and the cannula (2) allows delivery of an injection such that rotation of the driving means renders a downward axial force to the plunger (12) of the syringe (3) thereby aspirating contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2); while rotation of the guide nut (8) in the opposite direction moves the syringe (3) in an upward axial direction to reposition the cannula (2); and rotation of the driving means and the guide nut (8) in a repeated manner facilitates sequential delivery of multiple portions of the contents of the syringe barrel (7) along a single trajectory in a three-dimensional spiral array at a predetermined neural injection site.

35. (Previously Presented) The neural transplantation device according to Claim 2, characterized in that the driving means comprises a plunger driver (11) and a drive nut (10).

36. (Previously Presented) A method of using a neural transplantation device defined according to Claim 2 for administering an injection, comprising the steps of:
- positioning the syringe plunger (12) in an initial upward position;
- positioning the syringe barrel (7) with attached guide nut (8) in an essentially unwound

position inside the cylindrical barrel (5) of the sleeve (4) of the microinjector (1);

- rotating the driving means to advance the syringe plunger (12) in a downward axial direction through the syringe barrel (7) thereby aspirating and depositing a portion of the contents of the syringe barrel (7) through the side port holes (15A),(15B) of the cannula (2);

- rotating the guide nut (8) to effectively withdraw the syringe (3) and cannula (2) in an upward axial direction at a predetermined distance away from a previous neural target site; and

- repeating steps involving rotating the driving means to deliver a portion of the contents of the syringe barrel (7) and rotating the guide nut (8) to reposition the cannula (2), thereby resulting in sequential delivery of multiple portions of the contents of the syringe barrel (7) in a three-dimensional spiral array per single trajectory at a predetermined neural target site.

37. (Previously Presented) The method according to Claim 36, characterized in that the driving means comprises a plunger driver (11) and a drive nut (10).

REMARKS

Currently claims 1-37 are pending. Claims 2-7, 15-18, 21-33 and 35-37 are indicated as being allowed. Claims 10, 19-20 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claim. Applicant thanks Examiner Williams for her courtesy in the indication of allowable subject matter.

Claim 1 has been amended to add the term "longitudinally" to provide the claim detail suggested by the Examiner in the "Response to Arguments" section of page 6 of the Final Action. Thus, Examiner will not require further search or consideration.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below.

No additional fee is required for this amendment. However, the Commissioner is hereby authorized to charge payment of any fees due with this communication or credit any overpayment to Deposit Account No. 19-0513.

Date: December 28, 2005

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PTO/SB/44 (04-04)
Approved for use through 04/30/2007. OMB 0651-0033
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UNITED STATES PATENT AND TRADEMARK OFFICE

CERTIFICATE OF CORRECTION

PATENT NO : 7,137,969

DATED : November 21, 2006

INVENTOR(S) : Mendez

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 2
Line 2, After "et al.," insert -- Nature Medicine, 1 (11), pp. 1189-1194, 1995; Schumacher et --

Column 15
Line 18, delete "claim 2" and insert -- claim 1 --
Line 25, delete "claim 3" and insert -- claim 1 --
Line 36, delete "claim 5" and insert -- claim 1 --
Line 42, delete "claim 6" and insert -- claim 1 --
Line 45, delete "claim 7" and insert -- claim 1 --
Line 50, delete "claim 8" and insert -- claim 1 --
Line 54, delete "9" and insert -- 1 --
Line 57, delete "10" and insert -- 1 --
Line 61, delete "11" and insert -- 1 --
Line 64, delete "claim 12" and insert -- claim 1 --

Column 16
Between Lines 20 and 21, insert the present Claim 27 to replace the present Claim 14. --14. The method according to claim 13, characterized in that the driver comprises a plunger driver (11) and a drive nut (10). --
Line 21, delete "14." and insert -- 15. --
Line 21, delete "claim 13" and insert -- claim 14 --
Line 29, delete "15." and insert --16. --
Line 30, delete "1" and insert -- 2 --
Line 36, delete "16." and insert -- 17. --
Line 37, delete "1" and insert -- 16 --
Line 39, delete "17." and insert -- 18. --
Line 40, delete "16" and insert -- 4 --
Line 47, delete "18." and insert -- 19. --
Line 48, delete "16" and insert -- 17 --
Line 55, delete "19." and insert -- 20. --
Line 56, delete "1," and insert -- 19, --
Line 60, delete "20." and insert -- 21. --
Line 61, delete "1," and insert -- 20, --
Line 63, delete "21." and insert -- 22. --
Line 64, delete "1," and insert -- 21 --

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INVENTOR(S) : **Mendez**

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Column 17
Line 1, delete "22." and insert -- 23 --
Line 2, delete "1," and insert -- 22, --
Line 4, delete "23." and insert -- 24. --
Line 5, delete "1" and insert -- 23 --
Line 7, delete "24." and insert -- 25. --
Line 8, delete "1" and insert -- 24 --
Line 10, delete "25." and insert -- 26. --
Line 11, delete "1" and insert -- 25 --
Line 13, delete "26." and insert -- 27. --
Line 14, delete "claim 1" and insert -- claim 26 --
Line 41, delete "claim 27" and insert -- claim 14 --

Column 18
Line 16, delete "claim 2" and insert -- claim 1 --

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